

We claim:

1. A tissue approximating device comprising:

first and second jaw members, said first and second jaw members being moveable toward and away from one another;

a first and second retaining means, said first and second retaining means being located generally opposite one another on said first and second jaw members, respectively; and

first and second fastening members releasably secured to said first and second retaining means, respectively, said engaging means being configured such that when said first jaw member is moved toward said second jaw member, said first fastening member fixedly mates with said second fastening member.

2. The tissue approximating device of claim 1 wherein said first and second fastening members comprise a rivet and securing washer, respectively.

3. The tissue approximating device according to claim 1 further comprising a tissue engaging rod,

said tissue engaging rod having a tissue engaging portion that can extend generally parallel to said first and second jaw members and that is moveable from a first to second position.

4. The tissue approximating device of claim 3 wherein said tissue engaging rod is pivotally attached to said first and second jaw members.

5. A method of approximating the abdominal rectus muscles of a patient by adjoining the overlying tissue and rectus sheath surrounding said abdominal rectus muscles comprising:

forming an incision in the abdomen of a patient;

providing an applicator tool having

first and second jaw members, said jaw members being moveable toward one

another upon actuation of said applicator tool, and

at least one pair of fastening members releasably attached to said first and second

jaw members, respectively, said fastening members being configured to

fixedly mate upon engagement with one another;

inserting said applicator tool into said incision;

advancing said jaw members along the length of the abdominal rectus muscles within the rectus sheath;

actuating the applicator tool such that upon actuation said first and second jaw members move toward one another and at least one of the fastening members pierces the wall of the rectus sheath and fixedly mates with the other fastening member thereby fastening said rectus sheath tissue therebetween; and

removing said applicator tool from the incision.

6. A method of approximating tissue according to claim 5 wherein said step of providing an applicator tool further comprises providing an applicator tool further having a tissue engaging

rod having a tissue engaging portion that can extend generally parallel to said first and second jaw members and that is moveable from a first to second position; and further comprising the step of, after advancing the jaw members along the abdominal rectus muscles within the rectus sheath but prior to actuating the applicator tool, moving the lever arm such that tissue between said jaw members is engaged by the tissue engaging portion of said tissue engaging rod and is pressed downward.

7. A tissue approximating device comprising:

first and second jaw members moveable toward one another, said first and second jaw members having inner surfaces facing toward one another other, said inner surfaces of said first and second jaw members having at least one tooth member and at least one reciprocal cavity member, respectively, such that when the inner surfaces of said first and second jaw surfaces are moved toward one another said at least one tooth member on said first jaw member is received at least partially within said at least one reciprocal cavity member of said second jaw member.

8. The device of claim 7 wherein said first jaw member includes a lumen extending longitudinally through at least a portion of the first jaw member.

9. The device of claim 8 wherein said at least one tooth member of said first jaw member includes a recessed passageway extending longitudinally of the tooth member and opening toward both proximal and distal ends of said first jaw member, said passageway being axially aligned with said lumen.

10. The tissue approximating device according to claim 7 further comprising a tissue engaging rod,

said tissue engaging rod having a tissue engaging portion that can extend generally parallel to said first and second jaw members and that is moveable from a first to second position.

11. The tissue approximating device of claim 10 wherein said tissue engaging rod is pivotally attached to said first and second jaw members.

12. A tissue approximating kit comprising:

a tissue approximating device having first and second jaw members moveable toward one another,

said first and second jaw members having inner surfaces facing toward one another other, said inner surfaces of said first and second jaw members having at least one tooth member and at least one reciprocal cavity member, respectively, such that when the inner surfaces of said first and second jaw surfaces are moved toward one another said at least one tooth member on said first jaw member is received at least partially within said at least one reciprocal cavity member of said second jaw member, and a lumen extending longitudinally through at least a portion of the first jaw member; and

an elongate fastening member adapted to be slidably received within the first jaw member lumen and the passageway of said tooth member.

13. The tissue approximating kit according to claim 12 wherein said fastening member further comprises an elongate body having restraining elements that extend from the body.

14. The tissue approximating kit according to claim 13 wherein said tissue approximating device further comprises a tissue engaging rod, said tissue engaging rod having a tissue engaging portion that can extend generally parallel to said first and second jaw members and that is moveable from a first to second position.

15. The tissue approximating kit of claim 14 wherein said tissue engaging rod is pivotally attached to said first and second jaw members of said tissue approximating device.

16. A method of approximating the abdominal rectus muscles of a patient by adjoining the overlying tissue and rectus sheath surrounding said abdominal rectus muscles comprising:

forming an incision in the abdomen of a patient;

providing an applicator tool having

first and second jaw members moveable toward one another, said first and second

jaw members having inner surfaces facing toward one another other, said

inner surfaces of said first and second jaw members having at least one

tooth member and at least one reciprocal cavity member, respectively, said

first jaw member further having a lumen extending longitudinally through

at least a portion of said first jaw member, and said at least one tooth

member further including a passageway extending longitudinally of the

tooth member and opening toward both proximal and distal ends of said first jaw member, said recessed passageway being axially aligned with said lumen;

advancing said jaw members along the length of the abdominal rectus muscles within the rectus sheath;

actuating the applicator tool such that upon actuation, said first and second jaw members are moved toward each other, and at least one tooth member on said first jaw member is received at least partially within said at least one reciprocal cavity member of said second jaw member with a portion of said rectus sheath being located therebetween;

providing an elongate fastening member configured to be received through said first jaw member lumen;

advancing said fastening member through said first jaw member lumen and said tooth member passageway and through any tissue located therebetween.

17. A fastener cartridge for insertion onto a jaw member of a tissue approximation device, the fastener cartridge comprising:

a cartridge body, said cartridge body having a base configured for attachment to the jaw member and a driver member, said driver member having a fastener pin extending therefrom,

a retainer spring;

a fastner member releaseably secured to said retainer spring and to said fastner pin; and

a cartridge hood, said cartridge hood having a top surface with an opening and sidewalls extending at least partially over said cartridge body such that said retainer spring, fastener member and driver member are disposed within said cartridge hood.

18. The fastener cartridge of claim 17 further comprising means for maintaining said cartridge hood and said cartridge body in a fixed relationship to one another.

19. The fastener cartridge of claim 17 further comprising a lock tab on said cartridge and reciprocal recess on said cartridge body, said lock tab engaging said recess to maintain said cartridge hood and said cartridge body in a fixed relationship to one another.

20. A tissue approximation kit comprising:
at least two fastener cartridges according to claim 17; and
a tissue approximating device having first and second jaw members being moveable toward and away from one another and recesses at the distal ends of the jaw members configured to retain said fastener cartridges.

21. The tissue approximation kit of claim 20 wherein at least one fastener cartridge contains a first fastening member and at least a second fastener cartridge contains a second fastening member, said first and second fastening members configured to fixedly engage one another.